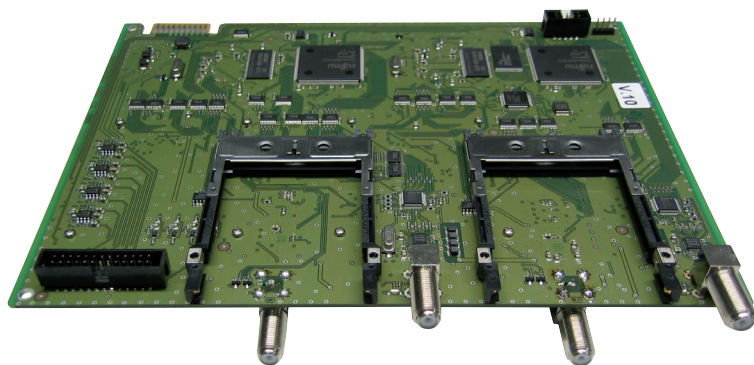


STC 160 Head-End Station QPSK AV module

HDC 480 CI AV



Notes on the Assembly Instructions.

As well as this supplementary Assembly Instructions, the Assembly Instructions for the STC 160 apply.

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1 Safety regulations



Please read the safety regulations listed in the assembly instructions for the STC 160 head-end station which pertain to this module.



Take precautions to prevent static discharge when working on the device!



Electronic devices should never be disposed of in the household rubbish. In accordance with directive 2002/96/EC of the European Parliament and the European Council from January 27, 2003 which addresses old electronic and electrical devices, such devices must be disposed of at a designated collection facility. At the end of its service life, please take your device to one of these public collection facilities for proper disposal.

2 General information

2.1 Scope of delivery

- 1 HDC 480 CI AV module
- 1 AV cable
- 1 CD (assembly instructions)
- 1 Brief Assembly Instructions

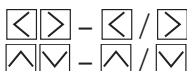
2.2 Meaning of the symbols used



Important note



General note



Optional use of the buttons



Performing works

2.3 Technical data

The requirements of the following are met:
2006/95/EC, 2004/108/EC

The product fulfils the guidelines and standards for CE labelling.

HF input:

Frequency range:..... 950 ... 2150 MHz
Level:60 dB μ V ... 80 dB μ V
Input impedance: typ. 75 Ω
Return loss: typ. 8 dB
Input data rate:..... 1 ... 45 MSymb

Output specifications:

Audio

Noise voltage ratio rated (DIN 45633):..... typ. 60 dB
Non-linear distortion factor:typ. 0.6 %
Frequency range:..... 20 Hz ... 15 kHz
Level at -12 dB:typ. 500 mV_{rms}
Impedance:..... typ. 1 k Ω

Video

Signal-to-noise ratio: typ. 54 dB (rated)
Level (75 Ω):typ. 1 V_{pp}
Impedance:..... typ. 75 Ω

Connections:

SAT inputs: 4 F-sockets
Connection strip (20-pin): For supply voltages and control circuits
AV output: 26-pin socket

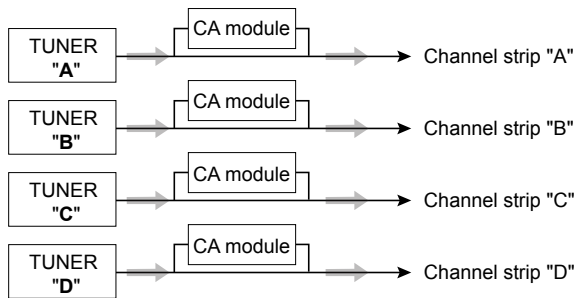
2.4 Description

The module HDC 480 CI AV, in the following called digital module, has a QPSK AV converter which simultaneously converts four QPSK modulated channels into AV signals. It is equipped with four common interfaces, which enable the decoding of four encrypted channels when used in conjunction with four CA modules and four appropriate smart cards. One channel can be decrypted with every common interface.

The digital module has four SAT inputs and one AV interface, through which the decoded AV signals are fed to the corresponding modulator module. Components (e.g. LNB) which are connected upstream can be powered through the SAT inputs.

The channel strips **"A"** **"B"**, **"C"** and **"D"** can be individually programmed. This means it is possible to select up to 4 channels from four transponders.

Signal transfer principle:



The prepared input signals are fed to the modulator module via the AV interface. From there, they are fed to the HF output collector of the head-end station, through which the level of the output signal can be adjusted via the software in the head-end station.

The digital module operating software can be updated using a PC or notebook and the software **"BE-Flash"** via the 9-pin D-SUB socket on the head-end station. You can find the current operating software for the digital module, the software **"BE-Flash"** and the current assembly instructions on the website **"www.gss.de"**.

This digital module is designed exclusively for use in the STC 160 head-end station.

3 Installation



Caution

- Ensure the head-end station is mounted so it will not be able to vibrate. Avoid, for example, mounting the head-end station onto a lift shaft or any other wall or floor construction that vibrates in a similar way.
- Before installing or changing a module, switch off the head-end station or unplug the power cable from the mains power socket.



Take measures to protect against ESD!

3.1 Retrofitting a CA module

The digital module is equipped with four common interfaces. It allows you to connect CA modules for various encryption systems and service providers. Encoded channels can only be decoded with a CA module suitable for the encoding system and the corresponding smart card. The smart card contains all the information for authorisation, decoding and subscription.



Caution

- **The hardware and software of the module HDC 480 CI AV have been thoroughly prepared and tested.**
- **Any changes made by program providers to the structures in the program data might impair or even prevent this function.**
- When working with a CA module, please read the corresponding operating manual from the respective provider.
- Insert the smart card ① into the CA module ② so that the chip ③ on the smart card faces the thicker side (top) of the CA module (fig. 1).
- Push the CA module ② without canting into the guide rails ④ of the common interface slot ⑤ according to the following picture and contact it to the common interface.

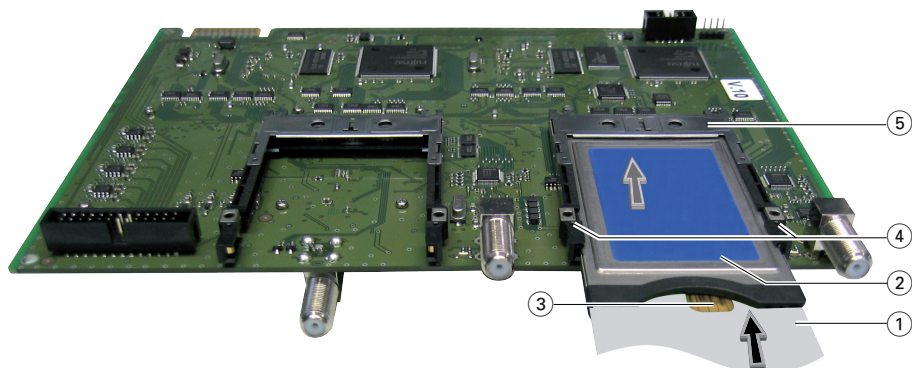


Fig.1

3.2 Installing the digital module



- If a CA module is used, check that the plug contacts of the CA module are tightly seated in the terminal strip on the digital module and make sure there is a reliable contact.
- Always position modules which belong together next to each other. The digital module must be installed to the left of the modulator module.
- When installing the digital module, make sure that it is inserted in a long numbered groove in front of a contact strip on the board at the rear wall of the housing.

The shorter not numbered grooves without a contact strip on the board at the rear wall of the housing are for add-on modules only.

- Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.
- Open the locking device ① in the direction of the arrow (fig. 2).

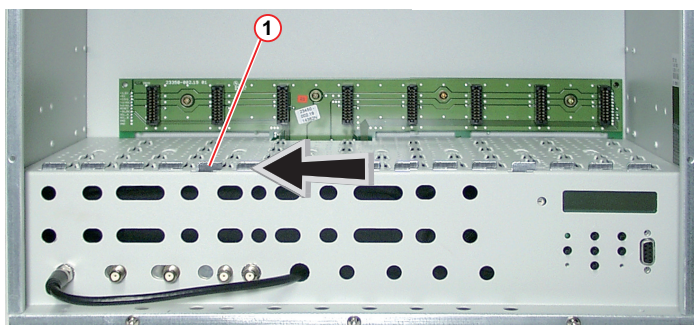


Fig.2

- Insert the digital module in grooves (A) and (B) of an open slot left to the associated modulator module and gently slide it into the head-end station until it makes contact with the board on the rear wall (fig. 3).

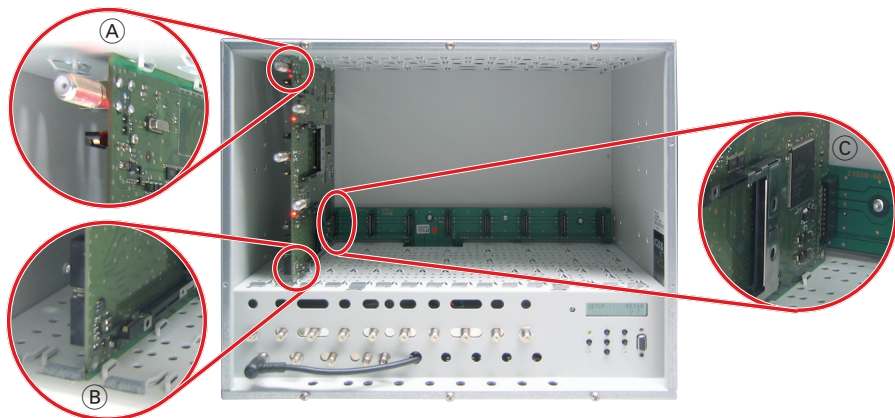


Fig.3

- Install the appropriate modulator module (fig. 4).
- > Figure 4 shows the slots 1 (digital module) and 2 (modulator module). The slot between them (without a contact strip on the board at the rear wall of the housing) is for an add-on module only.
- After installing the modules close the locking device (1) in direction of the arrow (fig. 4).

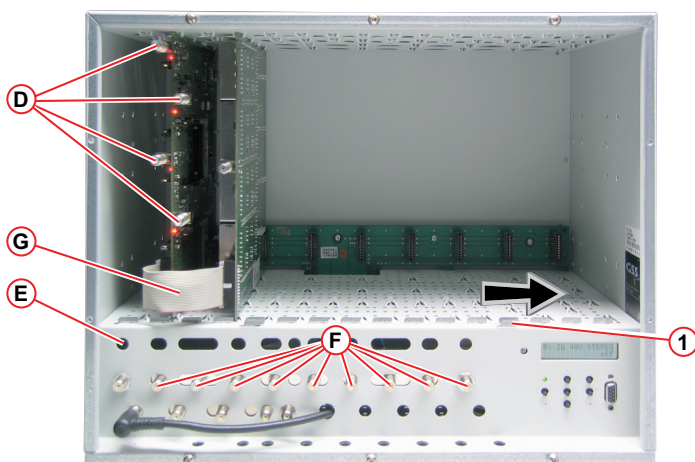


Fig.4


3.3 Connecting the digital module


- Connect SAT-IF inputs (C) of the digital module (fig. 4) to the preinstalled F terminals in the rear wall of the head-end station via the cable inlets (E) using HF cables made on-site (length approximately 80 cm) or if applicable to one of the outputs of a retrofitted SAT-IF input distributor.
- Using the ribbon cable (D) to connect the AV output of the digital module to the AV input of the modulator module.

4 The control panel at a glance

4.1 Menu items

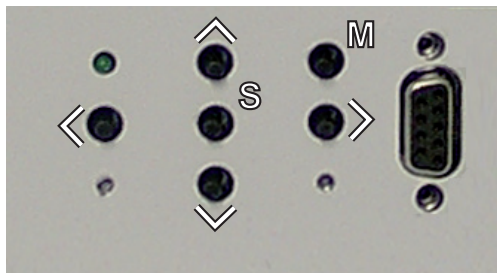
Program the module using the buttons on the head-end station control unit. The menus appear on the two-line display of the control unit. The parameters and functions to be set are underlined.







With the  button select the channel strip / other modules.

You can use the  button to select the following menu items:

- LNB oscillator frequency
- Symbol rate
- Input frequency
- Station filter
- Audio stream selection
- Audio output level
- Stereo decoding / audio type selection
- Picture format signal (WSS)
- Test lines
- Teletext subtitle / DVB subtitle / black shield
- Store

4.2 Functions of the control panel buttons



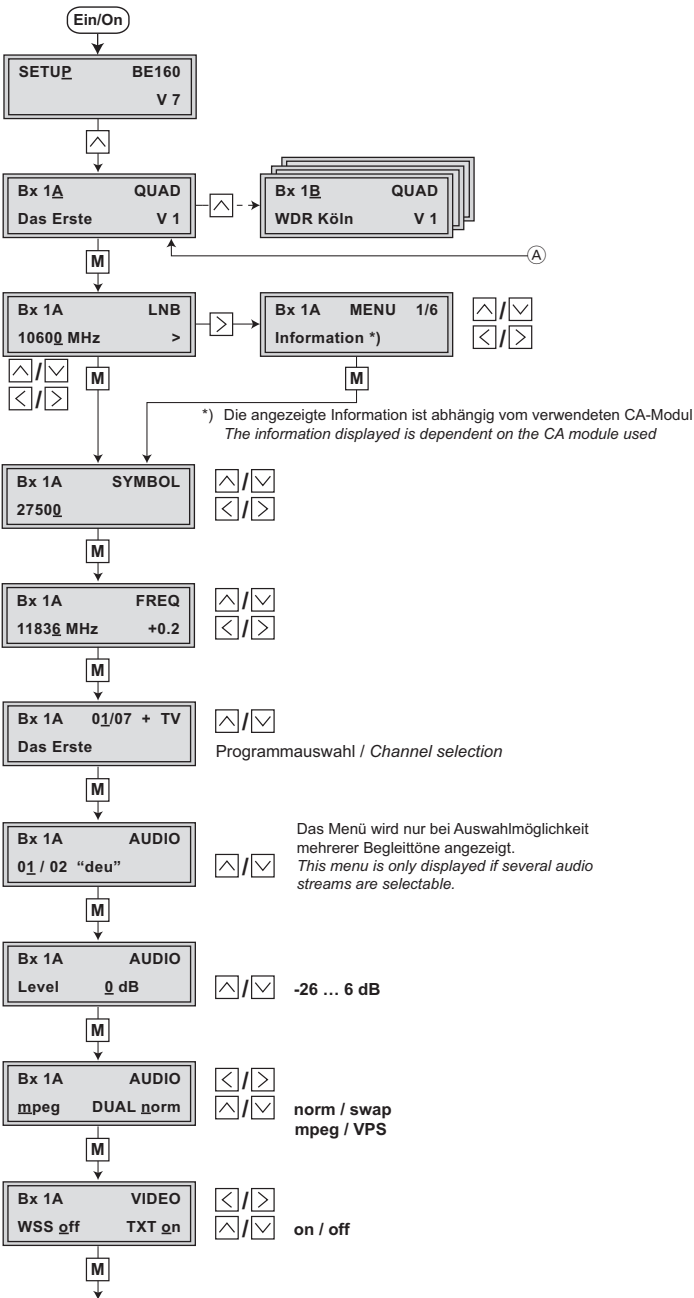
-   – To move the cursor
-   – To adjust values and functions
-  – To store the programmed data
-  – To switch to the next menu

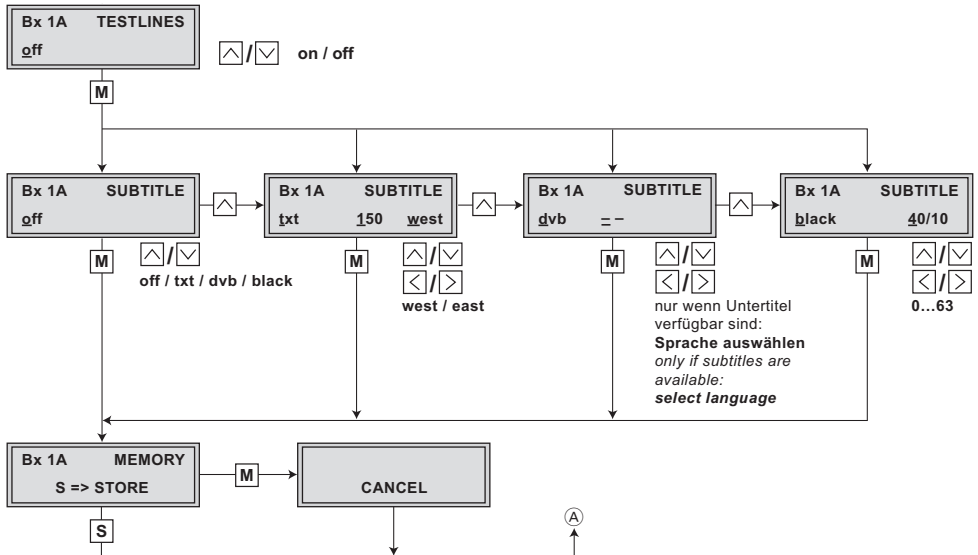
5 Programming

5.1 Preparation

- Connect the digital module to a programmed modulator module.
—> For the programming of the output channels please read the assembly instructions of the corresponding modulator module.
- Connect the test receiver to the HF output on the modulator module.
- Adjust the test receiver to the output channel of the channel strip to be set:
Digital module – channel strip “A” —> modulator module – channel strip “A”,
Digital module – channel strip “B” —> modulator module – channel strip “B”,
Digital module – channel strip “C” —> modulator module – channel strip “C”,
Digital module – channel strip “D” —> modulator module – channel strip “D”.

5.2 Programming procedure

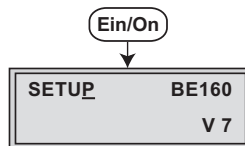




5.3 Programming the digital module



Notes:

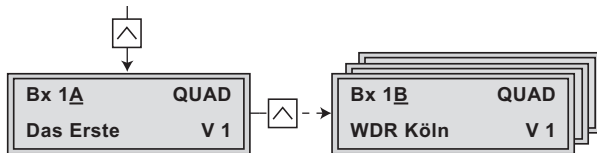
- Entries are saved by pressing the **[S]** button.
- > You will be returned to “**Selecting the module/channel strip**”.
- The programming process can be cancelled by pressing and holding the **[M]** button.
- > You will be returned to “**Selecting the module/channel strip**”.
- Switch on the head-end station.



- > The display shows “**SETUP BE160**” and the software version of the head-end station (e.g. V 7).
- > The output level of the output collector can be adjusted in the “**SETUP**” menu (see STC 160 assembly instructions).

Selecting the module / channel strip

- Press   repeatedly if necessary to select the particular module (**Bx ...**) or channel strip "**A**", "**B**", "**C**" or "**D**" to be programmed.



—> The display shows, e.g., the "**Bx 1A QUAD**" menu.

"**Bx**" indicates the slot
"1" indicates slot no. 1
"A" indicates channel strip "A"
"Das Erste" name of the selected channel
"V 1" software version of the module

5.3.1 Programming channel strip "A"






—> The following programming procedure shows the programming of channel strip "A".

- Press the  button:

—> The "Setting the LNB oscillator frequency" – "**LNB**" menu is activated.

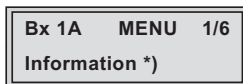
Setting the LNB oscillator frequency

| | |
|-----------|-----|
| Bx 1A | LNB |
| 10600 MHz | > |







- Using the   buttons, select the digit of the oscillator frequency to be set.
- Use the   buttons to set the oscillator frequency of the LNB being used.
- Press the  button.
—> The "Configuring the CA module" – "**MENU**" is activated.

Configuring the CA module, displaying card information

A menu has been provided for these settings, which is displayed on your TV screen. The menu varies according to which CA module is used. For this reason, please refer to the operating manual of your particular CA module. The relevant information is shown on the display of the head-end station.



—> *) The information shown in the display is dependent on the CA module used.

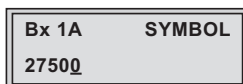
- Use   to select a menu item on the screen.
- Activate the menu item with .
- Select the required function with the   buttons.
- Press the  button to store the settings.






- Press the  button.

—> The "Setting the input symbol rate" – "**SYMBOL**" menu is activated.

Setting the input symbol rate

The symbol rate of the satellite transponder can be found in the current transponder tables of the various satellite trade magazines or on the website of the respective service provider.



- Using the   buttons, select the digit of the symbol rate displayed to be set.
- Use the   buttons to set the desired symbol rate.
- Press the  button.







—> The "Setting the input frequency" – "**FREQ**" menu is activated.

Setting the input frequency

—> Once the HF receiver has synchronised to the input signal, any offset to the target frequency is displayed in MHz, e.g. "**** 0.2**".

—> If a question mark “?” appears in the second line of the display, there is no input signal present. Check the configuration of the antenna system and head-end station as well as the preceding settings of the module in question.

| | |
|-----------|------|
| Bx 1A | FREQ |
| 11836 MHz | +0.2 |

- Using the   buttons, select the digit of the frequency displayed to be set.
 - Use the   buttons to set the input frequency.
 - Press the   buttons to adjust the input frequency displayed so that the frequency offset amounts to less than 1 MHz.
- > A status LED indicates the quality of the received input signal:

| LED indicator | Signal quality |
|---------------|----------------|
| Green | Good |
| Orange | Poor |
| Red | no signal |



- Press the  button.

—> The “Setting the station filter” menu is activated.

Setting the station filter

In this menu, select the channel from the data stream that is to be made available through this channel strip.

If the error message “**SERVICE no transponder**” appears, no input signal is present. In this case, you should check the previous settings as well as the configuration of the SAT antenna system.

If the “**scanning ...**” message appears on the display, the table of received channels is being read. Please wait until this process is finished.

As soon as the station filter has found all of the TV or radio channels, the corresponding data appears in the display of the head-end station.

| | |
|-----------|------------|
| Bx 1A | 01/07 + TV |
| Das Erste | |




Meaning of the indicators shown in this example:

- "01/07" – The second of a total of 7 channels has been activated.
- " + " – The audio stream for the current TV channel is available in several languages.
- "TV" – The data on the display corresponds to a TV channel.
- "Das Erste" – Channel name

Other possible indicators:

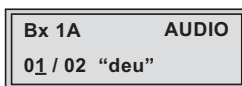
- "RA" – The data on the display corresponds to a radio channel.
- " * " – A star indicates that this TV or radio channel is encoded.
To enable the channels, a CA module and a smart card from the respective service provider are required.




- > For radio channels, the background of the screen of the connected TV or test receiver is darkened.
- > If a service number (e.g. "**SERVICE 131**") appears instead of "**TV**" or "**RA**", this indicates that an unnamed station or an undefined data stream is being received.

- Select the desired TV or radio channel with the   buttons.
- Press the  button.
 - > If the selected channel is broadcasted with two or more audio streams, the "Selecting the audio stream for a TV channel" – "**AUDIO**" menu will appear.
Otherwise the "Setting the volume level" – "**AUDIO Level**" menu is activated (see page 17).

Selecting the audio stream for a TV channel

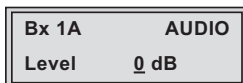
This menu only appears if the selected channel is broadcasted with two or more audio streams (languages). In this menu, select the desired audio stream from the transport stream.



- Use the   buttons to select the audio stream you want.
- Press the  button.
 - > The "Setting the volume level" – "**AUDIO Level**" menu is activated.

Setting the volume level

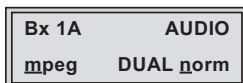
In this menu, you can balance unequal volume levels of TV and radio stations in the various channel strips.



- Set the volume level to the same level as the levels of the other output channels using the buttons (+6 dB ... -26 dB), if necessary.
- Press the button.
—> The “Setting the identification of the stereo / dual tone” – “**AUDIO**” menu is activated.

Setting the identification of the stereo / dual tone

In this menu, you can select whether the stereo audio identification is decoded from the VPS data or from the MPEG data stream. Further you can swap the languages on TV stations with dual tone.

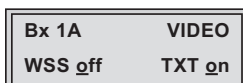


- Using the buttons, select the data stream from which the identification (“mpeg” or “VPS”) to be used.
- Use the buttons to select the dual tone code “DUAL ...” setting.
- Use the buttons to switch between “Dual norm” or “Dual swap” audio streams for dual tone TV channels.
- Press the button.
—> The “Adjusting the picture format” – “**VIDEO WSS**” menu is activated.

Adjusting the picture format signal, teletext mode

If problems with the automatic picture format switchover (e.g. 4:3, 16:9, Letter-box) arise with the connected devices, you can switch “off” the Wide Screen Signalling (WSS) in this menu.

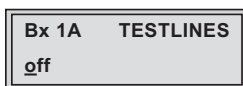
In addition you can activate or deactivate the teletext mode.



- To activate/deactivate WSS, use the ☐ ☐ buttons to select "off" or "on".
- To activate/deactivate teletext mode, use the ☐ ☐ buttons to select the teletext mode "TEXT on" and use the ☐ ☐ buttons to switch the teletext "off" or "on".
- Press the **M** button.
→ The "Activating test lines" – "TESTLINES" menu is activated.

Activating test lines

For specific applications test lines can be inserted in the teletext in this menu.



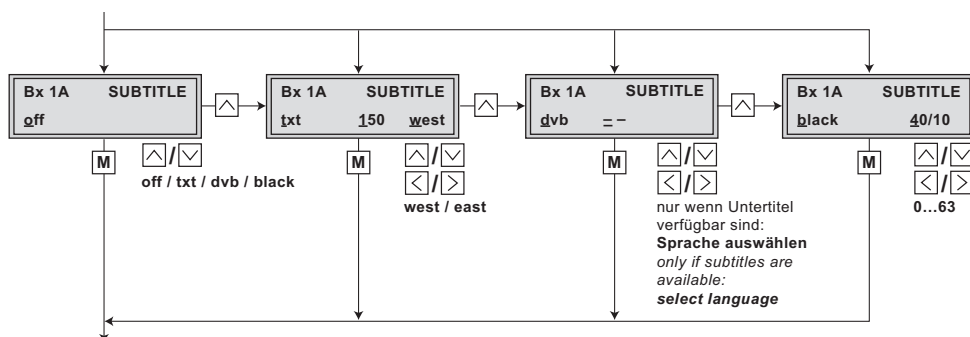
- Using the ☐ ☐ buttons switch the test lines "on" and "off"
- Press the **M** button.
→ The "Setting the subtitle functions" – "SUBTITLE" menu is activated.

If you do not want to change this setting, press the **M** button.

→ The "Storing data" – "MEMORY" menu is activated (see page 20).

Setting the subtitle functions

This menu allows subtitles (transmitted in teletext or DVB data stream) to be displayed directly in the channel or parts of the screen to be masked by a black bar. Using the ☐ ☐ buttons, the submenus can be selected. With setting "SUBTITLE - off" subtitle function is switched off.












Activating teletext subtitle pages and setting the standard

This menu allows subtitles transmitted in teletext to be displayed directly in the channel.

To display the characters for Western ("**west**") or Eastern ("**east**") European languages, the corresponding character set can be selected.

- Using the   buttons select the submenu "**SUBTITLE - txt**".

| | |
|-------|----------|
| Bx 1A | SUBTITLE |
| txt | 150 west |

- Using the   buttons select the digit of the page number to be set. Then use   to set each of the three digits.
- Using the   buttons select the teletext standard setting, e.g. "**west**" and use   to select the teletext standard "**west**" or "**east**".
- Press the  button to activate these settings and to leave the "Setting the subtitle functions" menu.






—> The "Storing data" – "**MEMORY**" menu is activated (see page 20).

Activating DVB subtitle pages

This menu allows subtitles transmitted in a DVB data stream to be displayed directly in the channel. The language of the subtitles can be selected.

- Using the   buttons select the submenu "**SUBTITLE - dvb**".



| | |
|-------|----------|
| Bx 1A | SUBTITLE |
| dvb | -- |

- Using the   buttons select "--" and select the language you want using the   buttons.
- > This selection is only possible if subtitles are available.
- Press the  button to activate these settings and to leave the "Setting the subtitle functions" menu.






—> The "Storing data" – "**MEMORY**" menu is activated (see page 20).

Activating the black bar

This menu allows to mask a part of the screen by a black bar. The vertical position and the height can be adjusted.




- Using the   buttons select the submenu "**SUBTITLE - black**".


| | |
|-------|----------|
| Bx 1A | SUBTITLE |
| black | 40/10 |

- Using the   buttons select the setting of "**vertical position / height of the bar**" and set the value you want using the   buttons.
 - Press the  button to activate these settings and to leave the "Setting the subtitle functions" menu.
- > The "Storing data" – "**MEMORY**" menu is activated.

Storing data

| | |
|------------|--------|
| Bx 1A | MEMORY |
| S => STORE | |

- All programmed data is saved by pressing the  button. Then you will be returned to the menu item "**Selecting the module / channel strip**" (page 13).
- Select the next channel strip "**B**", "**C**" or "**D**" by pressing the   buttons and programme it analogue to the programming of channel strip "**A**".

—> By pressing the  button, you will be returned to the menu item "**Selecting the module / channel strip**" **without** saving the programmed data.

6 Final procedures



After installing the head-end station, upgrading accessories or installing modules it is necessary to tighten all cable connections, F terminals and cover screws in order to maintain compliance with current EMC regulations.

- Securely tighten the cable connections (F connectors) using an open-ended spanner (spanner gap 11 mm).
- Test the output level of the output collector according to the STC 160 assembly instructions and set the output level required for the cable system.
- Mount the base plate and the front cover (see STC 160 assembly instructions).

Service:

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Email: service@gss.de